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Case Report

Metastatic adenocarcinoma of the mandibular condyle from uterine cervix: Report of a case

Goro Sugiyama[a,*], Yukiko Ohyama[a], Tamotsu Kiyoshima[b], Mayumi Shimizu[c], Eisuke Kaneki[d], Yasuharu Takenoshita[a]

[a] Section of Oral and Maxillofacial Surgery, Division of Maxillofacial Diagnostic and Surgical Sciences, Faculty of Dental Science, Kyushu University, Fukuoka, Japan
[b] Laboratory of Oral Pathology, Division of Maxillofacial Diagnostic and Surgical Sciences, Faculty of Dental Science, Kyushu University, Fukuoka, Japan
[c] Department of Oral and Maxillofacial Radiology, Division of Maxillofacial Diagnostic and Surgical Sciences, Faculty of Dental Science, Kyushu University, Fukuoka, Japan
[d] Department of Obstetrics and Gynecology, Graduate School of Medical Sciences, Kyushu University, Fukuoka, Japan

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ABSTRACT

Metastasis to the mandibular condyle is rare, and such lesions should be identified by both clinical and pathological examinations. We experienced a case of adenocarcinoma occurring in the right mandibular condyle. A 65-year-old female with uterine cervical cancer showed condylar dysfunction. Imaging examinations revealed a tumor with bone destruction and a rapidly progressive course, while pathological examinations suggested metastasis originating from another site. Based on the clinical and pathological findings, the patient was diagnosed with condylar metastasis derived from the uterine cervix, in addition to a recurrence of uterine cervical cancer.

1. Introduction

Functional impairment of the temporomandibular joint (TMJ) is caused by various diseases, including hypoplasia, inflammatory diseases, traumatic injuries, and both benign and malignant tumors [1]. The mandibular condyle is an integral component of the TMJ, and structural changes due to disease lead to TMJ dysfunction. Neoplastic lesions of the mandibular condyle are one of the most severe forms of disease. Although tumors in the TMJ are rare compared to other sites in the oral and maxillofacial region, several malignant tumors, including sarcoma, osteosarcoma, chondrosarcoma, synovial sarcoma, and invasive tumors originating from other organs, have been reported [2].

Metastatic tumors in the oral and maxillofacial region are uncommon, and account for only 1% of all metastatic tumors [3]. Such tumors usually develop in the mandibular bone, mostly in the molar region [4], and metastatic tumors in the mandibular condyle are extremely rare.

We herein present an unusual case of adenocarcinoma with bone destruction of the right mandibular condyle in an elderly female. Based on the imaging and pathological findings, we diagnosed this tumor as metastatic adenocarcinoma derived from the uterine cervix, in addition to a recurrence of uterine cervical cancer.

2. Case report

In April 2008, a 65-year-old female was referred to the Department of Oral and Maxillofacial Surgery of Kyushu University Hospital complaining of swelling and pain in the right TMJ. Her clinical history revealed uterine cervical cancer that was diagnosed in March 2007. The cancer stage was stage IIb according to the International Federation of Gynecology and Obstetrics clinical staging system and T2bN0M0 according to the TNM Classification. The tumors were removed via laparotomy, which included lymphadenectomy, in October 2007. The histological diagnosis was mucinous adenocarcinoma, and the margin of the removed tumor revealed the presence of residual malignant cells. Radiation therapy consisting of 45 Gy/25 Fr and chemotherapy comprising two courses of cisplatin and 5-fluorouracil were administered to treat the residual mass. After receiving this treatment, the patient was followed up by routine blood tests and hematochemistry.

On physical examination after her presentation to the Department of Oral and Maxillofacial Surgery, a mass measuring 30 mm × 30 mm in the right TMJ was observed (Fig. 1). The patient exhibited facial asymmetry, although she did not suffer from mandibular deviation. She demonstrated light trismus, with an interincisal mouth opening of 29 mm. X-ray examinations with both panoramic radiography and computed tomography (CT) revealed unclear tumor margins on the right mandibular condyle

* Corresponding author at: Section of Oral and Maxillofacial Surgery, Division of Maxillofacial Diagnostic and Surgical Sciences, Faculty of Dental Science, Kyushu University, Fukuoka 812-8582, Japan. Tel.: +81 92 642 6452; fax: +81 92 642 6392.
E-mail address: gnhs.moorin@gmail.com (G. Sugiyama).

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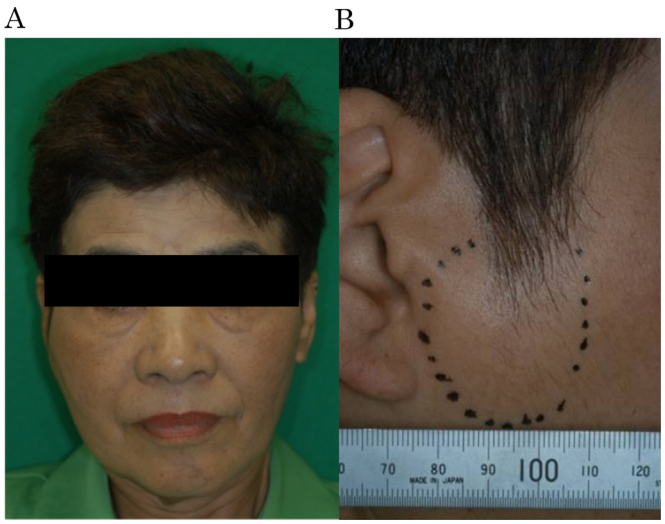

Fig. 1. Physical examinations in temporomandibular disorder. (A) Diffuse swelling in the right TMJ. (B) The mass measured 30 mm × 30 mm in size.

due to bone destruction and tumor invasion (Fig. 2). CT examinations disclosed a low-density mass measuring approximately 30 mm × 30 mm that invaded the condyle. The center of the mass was located there; however, the mass did not make contact with the right parotid gland. The patient's symptoms thereafter progressively worsened with significant bone destruction.

In order to evaluate the presence of malignancy at other sites, whole-body positron emission tomography with CT was performed with 18-fluro-2-deoxyglucose (FDG). An enhanced uptake of FDG

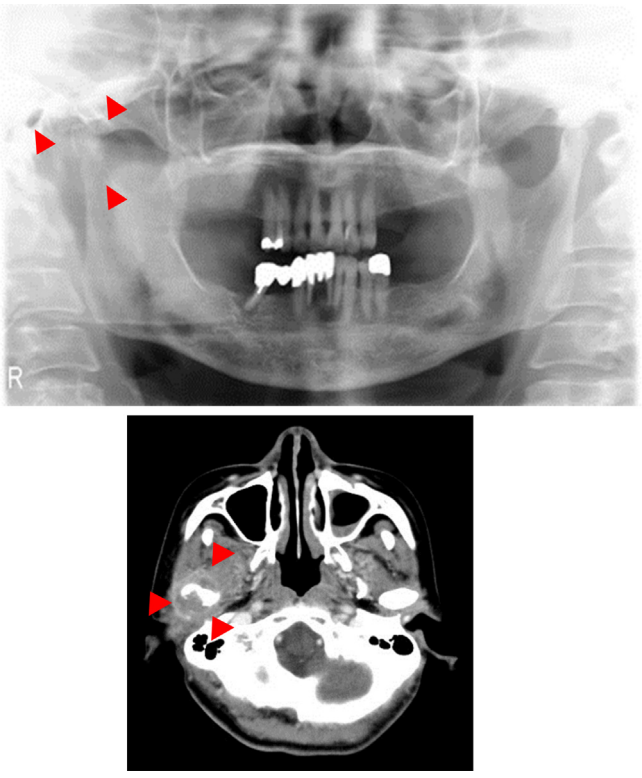

Fig. 2. Initial X-ray images obtained in April 2008. Panoramic radiography (upper) and computed tomography (lower) showed bone destruction and tumor spreading around the right mandibular condyle. The tumor is indicated by the red arrowheads. The mass was located in the central portion of the mandibular condyle. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of the article.)

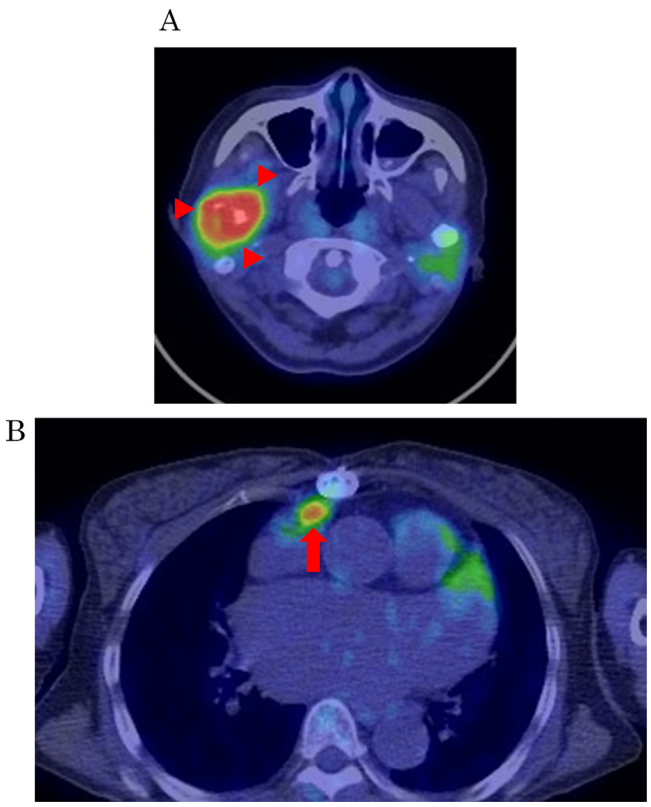

Fig. 3. Findings of positron emission tomography with computed tomography using 18-fluro-2-deoxyglucose. (A) The temporomandibular region exhibited significantly enhanced areas (indicated by red arrowheads). The maximum standard uptake value (SUV max) was 8.59. (B) The anterior mediastinum exhibited enhanced areas comparable to those observed in the mandibular condyle (indicated by red arrow). The SUV max was 4.98. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of the article.)

was seen in the right mandibular condyle (Fig. 3A) and the anterior mediastinum (Fig. 3B), with standard uptake values (SUVs) of 8.59 and 4.98, respectively. However, there was no significant enhancement in the uterine cervix. Cardiac examinations were performed because the patient suffered from ischemic heart disease. After confirming the status of the tumor by panoramic radiography and CT as a preoperative evaluation again in June 2008 (Fig. 4), the mass in the right mandibular condyle was biopsied to make a histological diagnosis (Fig. 5A). The CT images showed rapid mass growth and bone destruction causing the loss of the right mandibular condyle. An open biopsy was performed, and a 15 mm × 15 mm mass, including normal tissue, was removed (Fig. 5B). The histological diagnosis was adenocarcinoma. We ultimately diagnosed the tumor as metastasis originating from the uterine cervical cancer. A uterine cervical biopsy was performed again, and a recurrence of adenocarcinoma was detected.

Radiotherapy consisting of 30 Gy/10 Fr was performed on the right mandibular condylar mass, and followed by chemotherapy comprising two courses of carboplatin and paclitaxel to treat the patient's systemic disease. Due to insufficient efficacy, additional chemotherapy with two courses of camptothecin-11 and tegafur-uracil was planned; however, the patient died from an accident.

2.1. Histological examination

All surgical specimens were subjected to hematoxylin and eosin staining, and showed adenocarcinoma. Compared to the primary and recurrent uterine cervical tumors, the tumor cells in the right

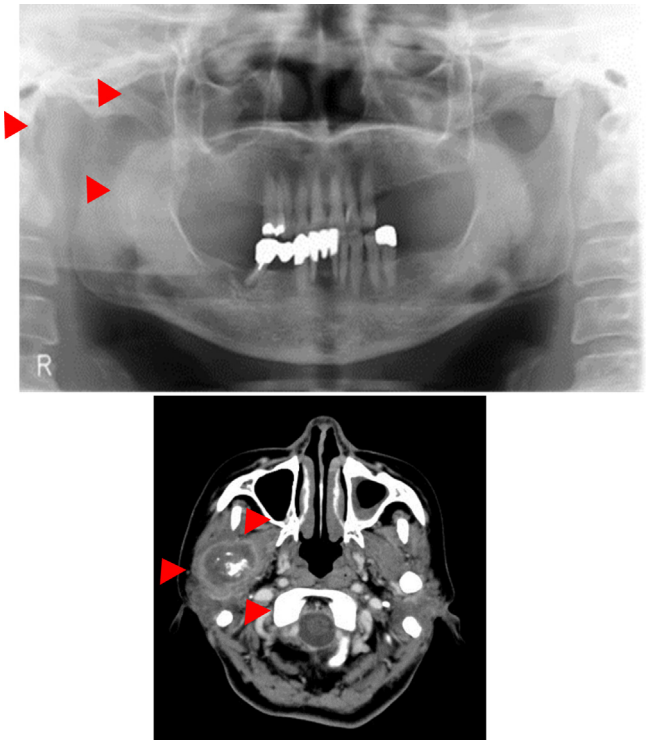

Fig. 4. Preoperative X-ray images obtained in June 2008. The findings of panoramic radiography (upper) and computed tomography (lower) revealed an increase in tumor size (indicated by the red arrowheads) with bone destruction. The right mandibular condyle appeared unclear due to the growth of the mass. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of the article.)

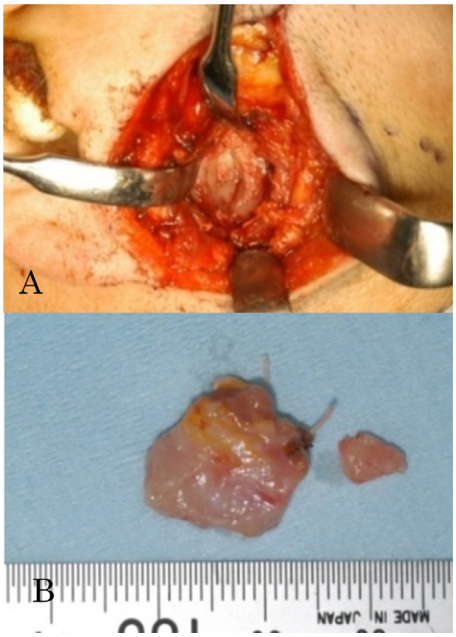

Fig. 5. Biopsy findings of the tumor removed from the right mandibular condyle. (A) Intraoperative view of the right mandibular condylar mass. (B) The biopsied specimen measured 15 mm × 15 mm in size.

mandibular condyle were poorly differentiated. The histopathological features of the lesions in the different sites are described below:

Right mandibular condyle: A proliferation of atypical cuboidal and/or ovoid cells with an irregular structure was noted in the biopsy specimens. Ductal differentiation was occasionally observed in the carcinoma nests. Part of the adenocarcinoma exhibited a cribriform growth pattern. Focal necrosis was also observed with mucin-containing cells (Fig. 6A).

Primary uterine cervix: The histopathological features revealed well-differentiated mucinous adenocarcinoma of the endocervical type, which invaded the entire width of the cervical wall. The tumor cells comprised atypical cuboidal cells proliferating in an atypical glandular pattern (Fig. 6B).

Recurrent disease in the uterine cervix: The histopathological features revealed well- to moderately-differentiated adenocarcinoma with mucin production, resembling the primary uterine specimen, indicating a recurrence of the uterine cervical cancer (Fig. 6C).

3. Discussion

Tumors in the TMJ are rare compared with other oral and maxillofacial regions. In this case, imaging examinations revealed a malignant tumor in the TMJ, having no contact with the parotid glands. Initially, we could not rule out the possibility of adenocarcinoma originating from the heterotopic salivary glands in the TMJ. Although Daniel et al. have pointed out malignant tumors of heterotopic salivary tissue in the periparotid region and upper cervical nodes may occur more frequently than those have been reported [5], there have so far been no reports of malignant heterotopic salivary tissue tumors occurring in the TMJ. Furthermore, approximately 80% of tumors arising from heterotopic salivary tissues in head and neck region are benign [6], with adenocarcinomas being

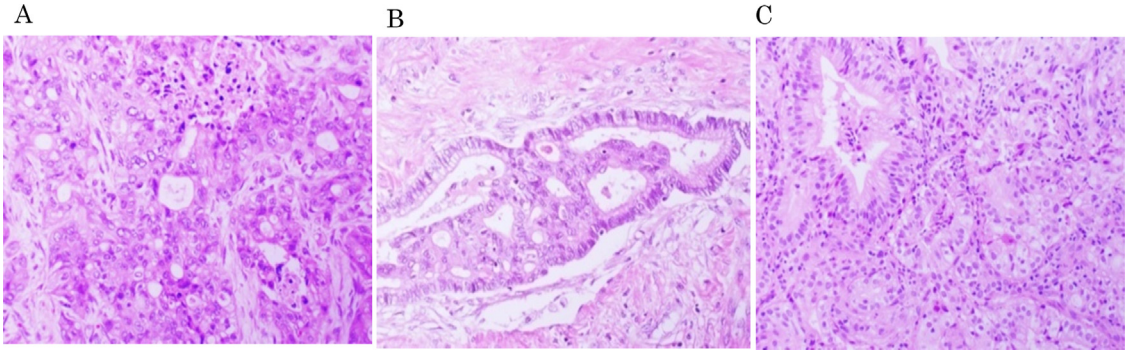

Fig. 6. Histopathologic features. (A) The biopsy specimen of the right mandibular condyle revealed poorly- to moderately-differentiated adenocarcinoma with a ductal structure. (B) The histopathological features of the primary uterine cervix lesions demonstrated well-differentiated mucinous adenocarcinoma. The tumor cells were composed of atypical cuboidal cells proliferating in an atypical glandular pattern. (C) The histopathological features of the recurrent uterine cervix revealed well- to moderately-differentiated adenocarcinoma with mucin production.

Table 1
Metastatic tumors to the mandibular condyle.

Case no.	Author	Age/sex	Primary site	Clinical findings	Tumor type
1	Blackwood, 1956 [15]	24 years/F	Breast	Pain	ns
2	Agerberg and Soderstrom 1974 [16]	46 years/F	Breast	Pain, trismus, swelling	Infiltrating duct carcinoma
3	Mace, 1978 [17]	54 years/F	Breast	Trismus	Adenocarcinoma
4	Wolujewicz, 1980 [18]	74 years/M	Prostate	Swelling	Adenocarcinoma
5	DeBoom et al., 1985 [19]	68 years/M	Prostate	Pain, cracking noise, swelling, trismus	Adenocarcinoma
6	Webster, 1988 [20]	52 years/F	Breast	Trismus	Adenocarcinoma
7	Rubin et al., 1989 [3]	67 years/F	Unknown	Pain, TMJ dislocation	Adenocarcinoma
8	Johal et al., 1994 [21]	65 years/F	Kidney	Pain, trismus	Neoplastic clear cells
9	Smolka et al., 2004 [22]	67 years/M	Stomach	Facial asymmetry, mandibular deviation	Adenocarcinoma
10	Jia et al., 2006 [23]	46 years/F	Breast	Trismus	Adenocarcinoma
11	Miles et al., 2006 [24]	78 years/F	Breast	Trismus	Adenocarcinoma
12	Sari et al., 2006 [25]	65 years/M	Lung	Pain, TMJ dislocation	Squamous cell carcinoma
13	Kamatani et al., 2008 [26]	59 years/M	Liver	Diffuse, firm, painless, swelling	Hepatocellular carcinoma
14	Boniello et al., 2008 [27]	60 years/M	Lung	Pain, trismus, abnormal occlusion	Adenocarcinoma
15	Kruse et al., 2010 [28]	73 years/M	Lung	Swelling	ns
16	Kruse et al., 2010 [28]	75 years/F	Unknown	Pain, trismus	Adenocarcinoma
17	Kruse et al., 2010 [28]	85 years/M	Unknown	Malocclusion	ns
18	Hashmi et al., 2011 [29]	50 years/M	Unknown	Swelling, trismus, tender	Adenocarcinoma
19	Freudlsperger et al., 2012 [30]	75 years/M	Prostate	Pain, trismus, swelling	Adenocarcinoma

F, female; M, male; TMJ, temporomandibular joint; ns, not specified.

rarely observed [7]. In addition to literature review, imaging findings with bone destruction and tumor progression suggested that tumor development was not involved in heterotopic salivary tissue.

Nearly 1% of all oral and maxillofacial malignancies involve metastatic lesions originating from other parts of the body [8]. Most metastases develop in bones, rather than soft tissue, especially in the mandibular body [9–11]. Bone metastasis is an undesired, but frequent course of certain cancers, particularly breast and prostate cancer, and less frequently, cancers of the lungs and kidneys [12]. The recent literature has described head and neck metastasis from uterine cervical cancer [13,14]. In fact, there were 19 cases of metastatic cancers in the mandibular condyle over the 56-year period between 1956 and 2012 (Table 1). The primary sites were the breast, prostate, lungs, liver, stomach, and kidneys, while cases of unknown origin were also reported [3,15–30]. Given the findings in unknown cases, the primary sites were not considered to be the uterine cervix. We could not find any cases of condylar metastasis from uterine cervical cancer in the English literature. However, the imaging and pathological examinations in this case, in addition to the patient's history, strongly suggested that the condylar mass was a metastasis from uterine cervical cancer. This report may be the first case of mandibular condyle metastasis from uterine cervical cancer.

Adenocarcinomas are the most common metastatic tumors in the oral region [10]. In our department, more than 75% of patients with metastatic tumors in the oral region during the last 30 years were found to have adenocarcinomas. Although the exact mechanisms underlying the development of condylar metastasis are poorly understood, recent reports suggest that anatomical peculiarities may explain the rarity of this type of metastasis [31]. The blood supply differs significantly between the mandibular body and condyle, which is thought to be responsible for the decreased incidence of metastasis in mandibular condyle.

Most cases of uterine cervical cancer involve adenocarcinoma, adenosquamous carcinoma, or squamous cell carcinoma, and the incidence of adenocarcinoma of the uterine cervix varies from 4% to 20% of all uterine cervical malignancies [10,32–34]. It is known that the prognosis of adenocarcinoma is poorer than that of squamous cell carcinoma [10,35–37]. Several reports have suggested that a greater number of undifferentiated cells exist in metastatic tumors compared with primary tumors [38–40]. Furthermore, radiation therapy may be a cause of changes in tumor differentiation. In the present case, adenocarcinoma cells in the mandibular condyle were less differentiated than those in the uterine cervix. Moreover, the examinations of enhanced images of the anterior mediastinum raised the possibility of multiple metastases. All of the findings in the present patient suggested that the metastatic adenocarcinoma in the mandibular condyle originated from the patient's uterine cervical cancer.

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